MARSSIM Workgroup Meeting
October 21 - 22
Working Notes

October 21
Meeting with the EPA Science Advisory Board, Radiation Advisory Committee
Location: Crystal City, VA

This is a very elementary summary of the key issues discussed at the meeting. It is presented here as it relates to the workgroup discussion on October 22.

Key Issues:

Difficult-to-measure radionuclides

Difficult-to-access	What is the criteria for the decision? These are difficult to control. How far must equipment be disassembled to show compliance? Balance technical accuracy with practical use
Risk vs. Perception	Development of DCGL Focus of MARSAME Guidance
100% scan	Consider cost of this definition What is 100% coverage for alpha at the DCGL Small vs. large operator - economy of scale - use "tools" during survey unit classification
Survey unit	Definition is increasingly important, emphasize more in SAME Considerations in dividing large equipment into multiple survey units Practical discussion of classification (not automatic 1 if simply on site) Promote philosophy of looking at the right things during classification
Model Interface	DCGL interface of model and measurement: dose models and construct models Inventory model to put an upper limit on survey Graded approach
Soft data	Impact on the uncertainty when incorporate soft data How to combine soft data with hard data in a practical manner Use of smears for release decisions Use of other soft data Consider bringing the discussion from SAS into SAME - statistics Subjective judgment of decision maker

October 22
Workgroup Discussion
Location: NRC, Rockville, MD

The workgroup began working through the case study examples and definitions of key terms. R. Meck commented that for the radiological release of materials and equipment, the DCGLs in use are a small fraction of dose-or risk-based standards that are used for the release of real property in MARSSIM. The workgroup also considered the approach used in the NRC Consolidated Guidance of grouping materials and equipment following a graded approach to the difficulty of the survey. When reach a defined difficulty level, the workgroup refers the user to the regulator.

Questions related to the definitions:

- 100% scan at the DCGL

  - **?** Does this mean 100% of all accessible areas
  - **?** Does this mean that the difficult to access area is < x % of the total area at the DCGL
  - **?** Does this mean 100% of the measureable area

- Survey Unit

  - **?** Can a large piece of equipment be considered as multiple survey units
  - **?** Practically, how is this implemented

- Soft data or information

  - ? Define soft data
  - ? Can soft data be used to make the decision to release
  - ? How can soft data be used

The summary bullets developed below capture the discussion flow and evolution of the definition and approach.

- Proposal developing chart: Measurable Area versus Difficult-to-access Area
- Develop groupings based on a graded approach to the measurement which includes accessibility, $DCGL_{ME}$ relative to the MDC, radionuclides of concern
- Changing "100% accessible" to "100% measurement" in the definition
- Developing a working definition of 100% measurement
- Use of "soft information"

- **Proposal developing chart: Measurable Area versus Difficult-to-access Area**

This was discussed and it was proposed instead to represent the discussion by the matrix below.

Measurable Area	Difficult-to-Access Area	
	Clean Clean	Dirty Clean
	Clean Dirty	Dirty Dirty

Propose a ratio of Measurable Area/Difficult-to-Access Area. For discussion consider 20%.

Related questions:

? Can the uncertainty be quantified relative to the % of item which is difficult-to-access? For example, if 30% of surface is difficult-to-access, can the stated uncertainty be 30% before any other factors are considered

- **Develop groupings based on a graded approach to the measurement which includes accessibility, DCGL $_{ME}$ relative to the MDC, radionuclides of concern**

Difficult-to-measure radionuclides are addressed as part of the discussion of reaching the $DCGL_{ME}$ at the MDC.

Group 1
Consider the simplest case - 100% measurable, MDC << DCGL $_{ME}$
This is 100% with respect to the radiation or the instrument.
Will then have to classify 1, 2, or 3.

Group 2
100% measurable, MDC • $DCGL_{ME}$
Class 1, 2, 3

For class 1, will need a conceptual model to prove the maximum < $DCGL_{ME}$ in difficult-to-access areas

Group 3
100% Measurable
MDC > $DCGL_{ME}$
Class 1, 2, and 3

Group 4
< 100% Measurable
MDC <<$DCGL_{ME}$

Group 5
< 100% Measurable
MDC • $DCGL_{ME}$

Group 6
< 100% Measurable
MDC > $DCGL_{ME}$

Group 7
Discuss approach with regulators

- **Changing "100% accessible" to "100% measureable" in the definition**

1) Definition - ***100% measurable***: *100% of the surface area is measured at or below the $DCGL_{ME}$*

Based on comment by Jean-Claude to address surface and volume separately this definition was modified to read as follows:

2) Modified Definition - ***100% measurable***: *Every surface area or volume is measured at or below the $DCGL_{ME}$*

Concern was expressed related to developing a dichotomy between surface and volume rather than discussing this in the context of the inventory of radionuclides. The workgroup recognizes that models do not currently exist for much of the equipment, yet the geometry is an issue that will increase the uncertainty. It is important to be attentive to calibration concerns related to the geometry of the item that is measured.

To address this concern the definition was modified to emphasize 100% measurement which then clarifies that issues such as geometry and calibration must be considered.

3) Modified Definition - ***100% measurement***: *Every surface or volume is measured at or below the $DCGL_{ME}$. The measurement can be a scan, a sample, or a count.*

■ **Developing a working definition of 100% measurement**

For purposes of continuing the implementation discussion, a working definition of 100% measurement was agreed upon.

4) Working Definition - ***100% measurement***: *All the radioactivity on, or within, is measured at # the DCGL* $_{ME}$.

■ **Use of "soft information"**

Soft information is used for two purposes: 1) as a tool; 2) for the release decision. When and how can soft information be used to release?

AS A TOOL:

Smear	May only be used to reject the hypothesis, can't use to show no contamination but can prove there is contamination
Sentinel Measurements	Use to develop the survey
Surrogate Measurements	Radionuclide surrogates
Process Knowledge	Use to develop the survey

FOR THE RELEASE DECISION:

Representative Measurement	This is used to bound the worst case scenario; example, one pump will be torn apart and measured as representative of a larger number.
Inventory Models	Used to bound the problem. Three types: Conceptual, Process, and Uncertainty The inventory model is used to define how much of the inaccessible area will be considered in the survey.